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The Effect of Content-Related and Unrelated Humor on Academic Engagement in Fourth-Grade Male Elementary Students

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A B S T R A C T

This study aimed to investigate the effect of content-related and content-unrelated humor on academic engagement among fourth-grade male students in Tehran. A quasi-experimental research design with pretest-posttest and control group structure was used. The statistical population included all fourth-grade male students in non-profit schools in District 5 of Tehran during the 2023–2024 academic year. Through multi-stage cluster sampling, three schools and three fourth-grade male classes were selected, with two classes assigned to the intervention groups (content-related and unrelated humor) and one class to the control group. A total of 88 students completed the study (29 in each intervention group and 30 in the control group). The academic engagement questionnaire by Wang et al. (2011), validated for Iranian samples, was used to assess outcomes. The intervention consisted of eight 45-minute sessions, in which science content was taught using either content-related humor or unrelated humor. Data were analyzed using ANCOVA and post hoc LSD tests in SPSS-23. The ANCOVA results indicated a significant effect of the intervention on academic engagement ($F(2, 86) = 16.688$, $p < 0.001$, $\eta^2 = 0.14$), showing that 14% of the variance in posttest scores was due to group membership. Post hoc comparisons revealed that the content-related humor group had significantly higher academic engagement than both the content-unrelated humor group (mean difference = 1.543, $p < 0.001$) and the control group (mean difference = 1.335, $p < 0.001$). However, no significant difference was found between the content-unrelated humor group and the control group ($p = 0.348$). The results demonstrate that humor strategies aligned with academic content significantly enhance student engagement, while unrelated humor does not yield a meaningful effect. Content-related humor should be prioritized as a pedagogical tool for fostering academic engagement in elementary education.

Keywords: *academic engagement, content-related humor, unrelated humor, elementary education.*

1. Introduction

Academic engagement has emerged as one of the most pivotal constructs in the psychology of education, closely linked to students' learning outcomes, motivation, academic success, and emotional well-being. Defined as the degree of attention, curiosity, interest, and passion that students exhibit when learning or being taught, academic engagement encompasses behavioral, emotional, and cognitive dimensions (Ben-Eliyahu et al., 2018). These components together form the foundation of active participation in academic contexts and contribute significantly to students' overall academic achievement and long-term educational trajectories (Amerstorfer & Freiin von Münster-Kistner, 2021; Faramarzi et al., 2019). Recent studies emphasize that fostering academic engagement, especially in elementary education, is essential not only for improving performance but also for cultivating positive attitudes toward learning (Azila-Gbettor et al., 2023; Ghayasvandian et al., 2019).

In the early years of formal education, students' levels of engagement are influenced by multiple factors, including teaching style, classroom environment, peer interactions, and the perceived relevance and enjoyability of content (Neaami & Piryaei, 2012; Zahed-Babalan et al., 2017). Of these, instructional methods that incorporate humor have gained growing attention for their potential to transform the learning atmosphere, reduce anxiety, and enhance motivation and attention (Banas et al., 2011). Humor in education is not merely a tool for entertainment; rather, when strategically integrated, it serves as a pedagogical strategy that facilitates learning, deepens conceptual understanding, and increases the retention of academic material (Seif, 2015; Ziaei-Mehr, 2014). Humor has also been shown to stimulate curiosity, encourage class participation, and foster a sense of psychological safety among students, thereby increasing their likelihood of engaging with learning content (Demir & Konik, 2021; Dowling, 2014).

The theoretical basis for integrating humor into education lies in cognitive-affective models of learning, which suggest that emotional states significantly affect the processing and storage of academic information. Positive emotions, including those evoked by humor, enhance working memory, reduce cognitive load, and promote more flexible thinking (Fasihezadeh et al., 2018; Sadat & Setayeshiazhar, 2019). Humor can serve as a form of scaffolding that makes challenging content more accessible and enjoyable, especially for young learners who may find academic instruction rigid or monotonous. For elementary students, humor can also serve as a bridge between familiar social play and formal academic content, enhancing engagement without compromising educational rigor (Fazlollahi et al., 2016; Zahrehvand, 2015).

Despite widespread acknowledgment of humor's benefits, its application in education varies significantly depending on how it is implemented. One of the most critical distinctions lies in whether the humor used is directly related to the content being taught. Content-related humor aligns with learning objectives and is embedded within instructional material to clarify concepts, provide memorable examples, or reduce perceived difficulty. In contrast, content-unrelated humor is more incidental or peripheral, such as humorous stories or jokes unrelated to the academic material but intended to create a lighthearted environment (Balta, 2016). While both types of humor can influence the learning atmosphere, their differential impact on academic engagement remains underexplored, particularly among elementary students who are in the foundational stages of developing academic self-concept and engagement patterns (Kahrizi et al., 2013; Pashaei et al., 2020).

The few existing studies comparing these two types of humor suggest that content-related humor may have a more significant and direct effect on academic outcomes. Afshar Kohan et al. (2016) found that integrating humor into a mathematics curriculum significantly enhanced students' mathematical creativity and engagement. Similarly, research by Ziaei-Mehr (2014) highlighted that the pedagogical use of humor, when aligned with lesson objectives, promotes better comprehension and student retention in second-language learning. Conversely, while unrelated humor can create a pleasant classroom atmosphere, it may distract from instructional goals if not carefully managed (Banas et al., 2011; Salavera et al., 2020).

Moreover, psychological research into the mechanisms behind humor's effectiveness suggests that its impact may vary based on students' perceptions of relevance and appropriateness. When students perceive humor as supporting their understanding of academic material, they are more likely to experience intrinsic motivation and meaningful engagement (Amerstorfer & Freiin von Münster-Kistner, 2021; Azila-Gbettor et al., 2023). In contrast, unrelated humor, although it may elevate mood temporarily, does not contribute directly to cognitive engagement and may result in only superficial attention (Ben-Eliyahu et al., 2018; Sadat & Setayeshiazhar, 2019).

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These findings underscore the importance of designing humor-integrated instruction that is pedagogically intentional rather than merely entertaining.

In the context of Iranian education, humor has traditionally been underutilized as an instructional tool, partly due to formal classroom structures and expectations of teacher authority. However, recent studies conducted in Iran indicate a growing interest in learner-centered methods that incorporate elements of creativity and emotional engagement. For example, Pashaei et al. (2020) demonstrated that concept mapping and similar interactive strategies significantly improved students' academic enthusiasm in science classes. Additionally, studies by Faramarzi et al. (2019) and Ghayasvandian et al. (2019) have highlighted the positive effects of emotional and classroom climate variables on students' academic identities and achievement. The use of humor—especially when grounded in the cultural and curricular context—represents a promising direction for furthering such student-centered approaches (Afshar Kohan et al., 2016; Faramarzi et al., 2019).

This study aims to build on existing literature by empirically investigating the differential effects of content-related and unrelated humor on academic engagement among fourth-grade male students in Tehran. The study focuses on the subject of science, a domain often perceived as abstract or difficult by young learners, and therefore highly suitable for humor-enhanced instruction. The interventions are based on a rigorously designed instructional package developed in consultation with educational psychologists, science teachers, and humor experts, ensuring both cultural relevance and pedagogical alignment (Fasihezadeh et al., 2018; Zahed-Babalan et al., 2017). The study adopts a quasi-experimental design with pretest-posttest control group comparisons to isolate the effect of humor type on post-intervention academic engagement.

The findings of this study have the potential to offer actionable insights for elementary educators, curriculum developers, and education policymakers in Iran and beyond. Specifically, the study addresses three critical gaps: the relative effectiveness of humor aligned with curriculum content versus humor used merely to entertain, the role of humor in increasing engagement in STEM-related subjects at early educational stages, and the application of humor as a culturally sensitive teaching strategy within the Iranian educational system (Lashkarlouki, 2013; Zahrehvand, 2015).

In sum, humor in education is not a trivial matter—it is a strategic resource capable of transforming traditional instruction into a more engaging, motivating, and effective process. However, to harness its full potential, educators must understand the nuances of different humor types and their implications for learning. This study seeks to provide empirical evidence on these distinctions and contribute to the broader understanding of how instructional humor can foster deeper and more meaningful academic engagement in young learners (Demir & Konik, 2021; Dowling, 2014; Seif, 2015). By focusing on both cognitive and affective outcomes, this research aligns with contemporary educational goals that prioritize holistic student development over narrow performance metrics. The implications are especially relevant in a rapidly changing educational landscape where student attention and engagement are increasingly challenged by external distractions and internal disengagement.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a quasi-experimental design with three groups: two experimental groups and one control group, utilizing a pretest-posttest design. The study population consisted of all fourth-grade male students enrolled in non-profit elementary schools in District 5 of Tehran during the academic year 2023–2024. Sampling was conducted using a multi-stage cluster method. Initially, three non-profit schools were randomly selected from the designated district. Within each selected school, one fourth-grade male class was randomly chosen. Of these three classes, two were purposively assigned to the intervention groups and one to the control group. The purposive selection of the experimental classes was based on the teachers' willingness and ability to integrate humor into their instruction and their commitment to cooperate throughout the intervention period. All participating teachers across the experimental and control groups were responsible for teaching fourth-grade science. Based on previous research and standard sampling practices, 90 students were initially selected. Due to attrition and exclusion criteria, the final sample consisted of 88 students: 29 in the content-related humor group, 29 in the content-unrelated humor group, and 30 in the control group.

2.2. Measures

2.2.1. Academic Engagement

The data collection tool used in this study was the Academic Engagement Questionnaire developed by Wang et al. (2011), which is grounded in the theoretical framework proposed by Fredricks, Blumenfeld, and Paris (2004). This instrument includes 23 items rated on a five-point Likert scale and assesses three dimensions of engagement: behavioral, cognitive, and emotional. The content validity of the questionnaire has been confirmed by expert reviewers. Reliability was assessed using Cronbach's alpha, yielding an overall reliability coefficient of 0.74. Subscale reliabilities were reported as 0.82 for both behavioral and cognitive dimensions, and 0.86 for the emotional dimension (Wang, 2024; Woreta, 2024).

2.3. Interventions

2.3.1. Content-Related Humor

The first experimental intervention involved the implementation of a humor-based educational package that was explicitly aligned with the content of the fourth-grade science curriculum. The development of this package began with consultations with professional humorists, followed by collaboration with university professors in educational psychology. Practical strategies were drawn from the book Using Humor in the Classroom by Evan Hoeler. Educational content was sourced from the official fourth-grade science textbook and the supplemental guidebook Sir ta Piyaz published by Gaj. To ensure alignment with curricular standards, feedback was gathered from 15 fourth-grade teachers and three fourth-grade students. Based on these consultations, the humor-integrated educational package was finalized, covering only those science concepts that could feasibly be adapted by the research team. Coordination sessions were held with the participating teachers to familiarize them with the intervention protocol and integrate their suggestions. The final package included verbal humor, visual humor, and physical/animated humor integrated into science instruction. This intervention was implemented over eight weekly sessions, each lasting approximately 45 minutes, during which students learned science concepts through structured humorous content designed to increase engagement and retention.

2.3.2. Content-Unrelated Humor

The second experimental group received an educational package that incorporated humor unrelated to the academic content. Although the humor was still verbal, visual, and physical in nature—similar to the first intervention—it was thematically detached from the core science material. Instead of integrating jokes or humorous materials that reinforced scientific content, the unrelated humor included general cartoon segments, playful anecdotes, and comedic elements that were designed to entertain and maintain a cheerful classroom atmosphere, without directly reinforcing the science lessons. This intervention also consisted of eight sessions over eight weeks, delivered in the same structure and duration as the content-related humor group. The intention was to isolate the effect of humor disconnected from content on student academic engagement.

2.4. Data Analysis

To analyze the data, both descriptive and inferential statistical methods were employed. Descriptive statistics included frequency distributions and percentages for qualitative variables, and measures of central tendency and dispersion for quantitative variables. Inferential statistics were used to test the research hypotheses. Specifically, univariate and multivariate analyses of covariance (ANCOVA and MANCOVA) were conducted to examine group differences while controlling for pretest scores. Data analysis was performed using SPSS version 23, and significance levels were evaluated accordingly.

3. Findings and Results

The final sample in this study consisted of 88 fourth-grade male students drawn from three non-profit elementary schools in District 5 of Tehran. Of these, 29 students (32.95%) were assigned to the content-related humor group, another 29 students (32.95%) to the content-unrelated humor group, and 30 students (34.09%) were in the control group. The students' average age across all groups was 10.24 years (SD = 0.41), with a minimum of 9.70 years and a maximum of 10.80 years. All participants were boys, as the study specifically targeted male students, and all were enrolled in fourth-grade science classes taught by teachers with at least five years of teaching experience. Attendance during the intervention sessions remained consistent, with only two instances of excused absences that did not impact the final analysis due to their single-session nature.

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At the pretest stage, the mean academic engagement score in the content-related humor intervention group was 61.24 with a standard deviation of 19.60, indicating a moderate level of engagement before the intervention. The same mean and standard deviation were observed in the content-unrelated humor group, suggesting that both groups were at an equal baseline prior to the intervention. In the control group, the mean score was slightly lower at 60.23 with a standard deviation of 14.50. At the posttest stage, the mean academic engagement score for the content-related humor group increased to 87.26 (SD = 16.38), and similarly, the content-unrelated humor group showed a post-intervention increase to 82.26 (SD = 16.38). In contrast, the control group demonstrated no substantial change, with a posttest mean of 61.23 (SD = 70.58), indicating that the intervention groups experienced notable improvements in academic engagement compared to the control (Table 1).

Table 1

Means and Standard Deviations of Academic Engagement Scores by Group and Assessment Time

Assessment Time	Group	Mean (SD)
Pretest	Content-Related Humor Group	61.24 (19.60)
	Content-Unrelated Humor Group	61.24 (19.60)
	Control Group	60.23 (14.50)
Posttest	Content-Related Humor Group	87.26 (16.38)
	Content-Unrelated Humor Group	82.26 (16.38)
	Control Group	61.23 (70.58)

Prior to conducting the ANCOVA and MANCOVA analyses, statistical assumptions were tested and confirmed. The normality of the academic engagement scores was assessed using the Shapiro-Wilk test, which indicated no significant deviation from normality for either the pretest ($W = 0.978$, $p = 0.128$) or posttest scores ($W = 0.982$, $p = 0.212$). Homogeneity of variances was examined using Levene's test, which showed non-significant results at the pretest ($F = 0.621$, $p = 0.540$) and posttest ($F = 1.017$, $p = 0.367$), confirming equal variances across groups. The assumption of homogeneity of regression slopes was also tested and met, as the interaction between the covariate and group was not statistically significant ($F = 1.183$, $p = 0.312$). Finally, Box's M test was conducted for the multivariate model and yielded a non-significant result ($M = 11.762$, $F = 1.901$, $p = 0.122$), indicating equality of covariance matrices. Collectively, these results confirmed that the assumptions necessary for covariance analyses were satisfied.

To examine the effect of the interventions on academic engagement, a one-way ANCOVA was conducted using posttest scores as the dependent variable and pretest scores as the covariate. The results are presented in Table 2. The effect of the covariate (pretest academic engagement) on the posttest scores was not statistically significant ($F(1, 86) = 1.501$, $p = 0.06$, $\eta^2 = 0.04$), indicating that pretest scores did not significantly predict posttest engagement after adjusting for group differences. However, there was a statistically significant main effect of the intervention group on posttest academic engagement scores ($F(2, 86) = 16.688$, $p < 0.001$, $\eta^2 = 0.14$), demonstrating that the type of humor-based instruction had a meaningful impact. The partial eta-squared value of 0.14 suggests that approximately 14% of the variance in academic engagement scores can be attributed to the intervention, reflecting a moderate effect size.

Table 2

ANCOVA Results for Academic Engagement Posttest Scores

Source	SS	df	MS	F	p	η^2
Pretest	287.541	1	287.541	1.501	0.060	0.04
Group	30.226	2	15.113	16.688	0.001	0.14
Error	76.074	86	0.906			
Total	124505.000	88				

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Estimated marginal means for the posttest scores across groups are shown in Table 3. Students in the content-related humor group had the highest adjusted mean (M = 38.88, SE = 0.15), followed by the content-unrelated humor group (M = 37.34, SE = 0.15), and the control group (M = 37.54, SE = 0.15). Although the means of the content-unrelated humor and control groups were similar, the related humor group clearly outperformed both.

Table 3

Estimated Marginal Means for Academic Engagement Posttest

Group	Mean	SE	95% CI Lower	95% CI Upper
Content-Related Humor	38.884	0.155	38.575	39.193
Content-Unrelated Humor	37.341	0.157	37.029	37.653
Control	37.549	0.153	37.245	37.853

Post-hoc comparisons using the Least Significant Difference (LSD) test, as shown in Table 4, revealed that the content-related humor group differed significantly from both the content-unrelated humor group (mean difference = 1.543, $p < 0.001$) and the control group (mean difference = 1.335, $p < 0.001$). However, the difference between the content-unrelated humor group and the control group was not statistically significant (mean difference = 0.208, $p = 0.348$). These findings suggest that humor strategies integrated with academic content are significantly more effective in enhancing student academic engagement than humor that is unrelated or traditional instruction without humor.

Table 4

LSD Post-Hoc Comparisons Between Groups on Academic Engagement Posttest

Group (I)	Group (J)	Mean Difference (I–J)	SE	p	95% CI Lower	95% CI Upper
Content-Related Humor	Content-Unrelated Humor	1.543*	0.222	0.000	1.101	1.985
Content-Related Humor	Control	1.335*	0.217	0.000	0.903	1.766
Content-Unrelated Humor	Control	0.208	0.221	0.348	-0.231	0.648

4. Discussion and Conclusion

The purpose of this study was to examine the impact of content-related and unrelated humor on academic engagement among fourth-grade male students in Tehran. The results of the analysis of covariance revealed a statistically significant difference in posttest academic engagement scores across the three groups, indicating that humor-based educational interventions influenced students' academic engagement. Specifically, the group receiving content-related humor instruction demonstrated significantly higher engagement than both the unrelated humor and control groups. Furthermore, while the unrelated humor group also showed slightly higher mean scores than the control group, the difference was not statistically significant. These findings suggest that the effectiveness of humor in educational settings largely depends on how closely the humor is aligned with the instructional content.

The significance of these results lies in the confirmation of the educational value of content-related humor. When humor is integrated into the learning material in a pedagogically meaningful way, it can enhance student focus, motivation, and emotional involvement with the subject matter. This finding aligns with the theoretical framework proposed by Ben-Eliyahu et al. (2018), who conceptualized academic engagement as a multidimensional construct composed of affective, behavioral, and cognitive components. In the present study, the integration of humor within scientific content likely activated all three dimensions, contributing to a more immersive and enjoyable learning experience (Ben-Eliyahu et al., 2018).

This outcome is supported by earlier research demonstrating the positive impact of humor when it is used to clarify content, present analogies, or reduce cognitive tension in complex subjects. For instance, Afshar Kohan et al. (2016) found that students exposed to a humor-integrated mathematics curriculum showed significantly higher levels of creativity and conceptual understanding. Similarly, Ziaei-Mehr (2014) emphasized that educational humor, when strategically linked to learning objectives, facilitates more profound processing and retention of information. In

contrast, humor that is incidental or disconnected from learning objectives—such as unrelated jokes or comedic stories—may entertain but does not necessarily promote deep learning or engagement (Afshar Kohan et al., 2016; Ziaei-Mehr, 2014).

The absence of a significant difference between the unrelated humor group and the control group in our study further underscores this distinction. While unrelated humor might generate a temporary affective boost or positive classroom atmosphere, it lacks the pedagogical structure necessary to translate amusement into meaningful academic involvement. Banas et al. (2011), in their comprehensive review of humor in education, similarly concluded that only content-relevant humor yielded consistent educational benefits, whereas unrelated humor could sometimes even detract from learning by distracting students (Banas et al., 2011). Our findings reinforce this conclusion in the context of Iranian primary education, particularly in science instruction, where abstract and technical content can benefit from strategic humor integration.

Another important explanation for the superiority of content-related humor lies in its ability to create cognitive congruence. According to cognitive-affective models, students are more likely to engage with information that simultaneously stimulates both emotional interest and cognitive processing (Fasihezadeh et al., 2018; Sadat & Setayeshiazhar, 2019). When humor is used to illustrate a scientific principle or dramatize a classroom demonstration, students are not only entertained but also encouraged to think critically and make connections between the joke and the academic content. This kind of humor acts as a "dual encoder" that reinforces learning through both affective and intellectual channels, thereby enhancing academic engagement (Fazlollahi et al., 2016).

In addition to these cognitive mechanisms, the social and emotional context of learning plays a pivotal role in shaping students' academic engagement. As highlighted by Amerstorfer and Freiin von Münster-Kistner (2021), positive student-teacher relationships and emotional classroom climates are strongly correlated with higher engagement. Humor, particularly when used appropriately and empathetically, can strengthen these relationships and contribute to a more welcoming and supportive learning environment (Amerstorfer & Freiin von Münster-Kistner, 2021). In our study, the use of content-related humor may have enhanced the perceived approachability and enthusiasm of teachers, further motivating students to participate actively.

The present findings also resonate with previous studies conducted in Iranian educational settings. For example, Pashaei et al. (2020) found that innovative teaching strategies, such as group concept mapping, improved academic enthusiasm in science classes, suggesting that non-traditional pedagogies are particularly effective in engaging young learners. Moreover, the work of Zahed-Babalan et al. (2017) demonstrated that variables like school quality of life and academic self-concept play a critical role in shaping academic enthusiasm. Integrating humor into instructional content may directly enhance these variables by making learning feel more personalized, relevant, and less intimidating (Pashaei et al., 2020; Zahed-Babalan et al., 2017).

Cultural considerations are also essential in interpreting these results. Humor in Iranian classrooms has often been treated with caution, owing to traditional hierarchies and expectations of discipline. However, the findings of our study suggest that when humor is used thoughtfully and tied to curriculum content, it does not undermine authority but rather enhances teacher credibility and student responsiveness (Balta, 2016; Demir & Konik, 2021). Dowling (2014) emphasized that students appreciate and remember content delivered through humor, especially when it reflects their experiences and interests. In the present study, the humor used in science instruction was specifically designed with cultural appropriateness in mind, incorporating familiar characters, local narratives, and visual aids that resonated with the students' backgrounds (Dowling, 2014).

Interestingly, the findings did not reveal any significant differences in academic engagement based on the pretest scores, suggesting that prior levels of engagement did not strongly influence students' responsiveness to the humor-based interventions. This indicates the potential for content-related humor to serve as a universal engagement strategy, effective regardless of students' initial disposition toward academic participation. This finding supports the view of education psychologists like Seif (2015), who argue that engagement can be cultivated through structured interventions, even among students with initially low motivation (Seif, 2015).

Furthermore, our findings offer implications for the development of early engagement habits that may persist through subsequent educational levels. According to Kahrizi et al. (2013), early academic self-efficacy and satisfaction significantly influence long-term academic performance. Engaging students through humor during critical

developmental years may contribute to a more positive self-concept and sustained academic motivation (Kahrizi et al., 2013). This is particularly relevant for science education, where early disengagement often predicts future disinterest or avoidance of STEM fields.

In sum, this study demonstrates that not all humor is created equal in the classroom. Content-related humor, carefully designed to align with instructional goals and culturally adapted to the student population, significantly enhances academic engagement. Unrelated humor, while potentially beneficial for creating a relaxed classroom environment, lacks the cognitive and affective power to produce measurable academic benefits. These findings contribute to a more nuanced understanding of how humor functions in education and underscore the importance of pedagogical intentionality in humor use.

Despite its promising findings, this study has certain limitations that should be acknowledged. First, the sample was limited to male fourth-grade students from non-profit schools in one district of Tehran, which restricts the generalizability of the results. Future studies should include more diverse populations across different regions, educational levels, and both genders. Second, the study focused solely on science education; the effects of humor may vary across subjects such as mathematics, literature, or social studies. Third, although the study used a reliable instrument to measure academic engagement, it relied entirely on self-report data, which can be influenced by social desirability or individual interpretation. Finally, the duration of the intervention was limited to eight sessions, which may not capture the long-term impact of humor-based instruction on engagement and academic outcomes.

Future research should consider longitudinal designs to examine the sustained effects of content-related humor on academic engagement and achievement. It would also be beneficial to explore the interaction between humor and individual learner characteristics, such as personality traits, learning styles, or emotional intelligence. Researchers might also investigate how different types of humor—verbal, visual, or physical—differentially impact various dimensions of engagement. Moreover, studies comparing humor strategies in face-to-face versus online learning environments could provide insights relevant to digital education contexts. Expanding the research to include teacher perceptions and classroom dynamics would further enrich our understanding of humor's pedagogical role.

Teachers are encouraged to integrate humor that is directly connected to the curriculum content, especially in subjects that students often find difficult or abstract. Educational authorities should consider providing training for teachers on how to design and implement content-relevant humor effectively, including culturally sensitive approaches. Curriculum developers might also embed humor-based modules or examples into textbooks and instructional guides. Finally, school administrators should foster a school climate that supports innovative and emotionally responsive teaching methods, recognizing the role of humor not only as a motivational tool but also as a means of promoting deeper engagement and enjoyment in learning.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This study was approved by the Ethics Committee of Islamic Azad University, Sari Branch, under the code IR.IAU.SARI.REC.1403.110.

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